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ABSTRACT

This document contains a brief on operating grants for the purpose of communicating system estimates of future university operating needs in Ontario universities to the Committee on University Affairs. Section II traces briefly the major financial developments of the past decade and the third section contains some impressions on the impacts of the 1970-72 financing levels on the universities. Section IV presents future enrollment projections and a preliminary estimate of the financial commitment that might be required to meet these enrollment levels if current policies and trends continue. The final section presents the specific concerns of the universities in the financing of research and part-time education. (HS)

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BRIEF TO THE COMMITTEE ON UNIVERSITY AFFAIRS

DECEMBER 1970

COMMITTEE OF
PRESIDENTS OF UNIVERSITIES
OF ONTARIO

SUBCOMMITTEE ON
OPERATING GRANTS

CONTENTS

I INTRODUCTION

I-A Approach of this Brief

This is the fourth in a series of CPUO briefs on operating grants, begun in 1967-68 for the purpose of communicating system estimates of future university operating needs to the Committee on University Affairs. Previous briefs have concentrated on the requirements for the year immediately following, with the primary focus on the desired value of the income unit. These briefs have been devoted largely to identifying quantitative descriptors of university operations (trends in components of operating expenditures, faculty/weighted enrolment ratios, unit costs, and academic salaries). A major emphasis has been the analysis of increases in academic salaries because of the large effects that market factors have had on these increases.

While we do not depart from the general object of providing quantitative parameters for the evaluation of university development, we are changing the focus and content substantially this year for several reasons. First, the Minister's announcement of a likely 4.8% increase in unit value for 1971-72 has lessened our emphasis on the immediately ensuing year, other than to comment upon the probable effects of this increase on the system. Second, the forecasting of cost changes one year ahead has been a risky business; an estimate two years into the future would be even more speculative. We should mention here that previous briefs have concentrated on the effects of "trading off" rather than just carrying forward the effects of inflation on a constant distribution pattern; thus, our concern for the staff/weighted enrolment ratio and its impact on university costs. Where such preferential tradeoffs are possible, different distributions of expenditures are possible and forecasting is made even

more risky. A third reason for a different style of brief is that at the beginning of a new decade it seems appropriate to take a retrospective look at the decade just past and attempt to assess what the next five to ten years might have in store for Ontario universities.

The brief continues from this introduction to a summary of the main conclusions. Following this, in Section II we trace very briefly the major developments of the past decade. Section III contains some impressions on the impacts of 1970-71 and 1971-72 financing levels on the universities. In Section IV we take out the crystal ball and attempt to envision what the future might hold for us in the way of enrolment. We then make a very preliminary estimate of the financial commitment which might be required to meet these enrolment levels if current policies and trends continue. Finally, in Section V we present certain additional specific concerns of the universities which will significantly affect their development in the decade ahead - the financing of research and of part-time education.

I-B Summary of Conclusions

Our brief begins with a few simple statistics to illustrate the dramatic growth of the Ontario university system in the decade of the sixties. The number of full-time students has increased almost fourfold since 1960. To meet this expansion the number of universities doubled.

Cost increases have been even more dramatic than enrolment increases. We have traced the effect of various factors upon the increase in operating grants, some of which are readily quantifiable, and others which are not. Factors which have had a major impact upon unit costs have been the creation of new institutions and expansion of programmes in existing universities, the cost implications of keeping up with the vastly increased

sophistication of knowledge and technology, indirect costs associated with assisted research, and the upgrading of staff salaries and qualifications in order to make Ontario universities competitive on the international market during a period of rapid expansion. It has been a decade of extraordinary accomplishment, as both the government and the universities have responded resourcefully to the challenge of providing greatly increased educational opportunity for the young people of Ontario.

As in previous briefs, we have examined staff/income unit ratios and the distribution of budgeted operating expenditures for the current year. The data for staff/income unit ratios in the emerged universities over a three-year period indicate that they managed to prevent a deterioration last year, and expect to be able to do so again in 1970-71. The ratios for the emerging universities rose markedly last year, and are expected to remain at about the same level for the current year. There are few shifts evident in the proportions of university expenditures going to various budgetary categories; the percentage devoted to academic salaries is expected to rise somewhat in the current year, and the percentage devoted to the purchase of books and periodicals has been dropping substantially. The increase in average academic salaries for 1970-71 is 8.2%, a level indentical to the preceding year. These levels of salary increases have not been inconsistent with trends in the rest of the economy. It is clear that increases in unit value which are substantially below the general levels of salary increase, when salaries account for over 3/4 of university budgets, place the universities in a budgetary squeeze. We are concerned that such a discrepancy between unit value increases and cost pressure, if continued,will have serious consequences for the effectiveness of university operations. We conclude section III by expressing

the hope that the practice of two-year announcements of likely funding levels will be maintained on a rolling basis, in order to promote more realistic budgeting on the part of the universities.

In section IV, we look at probable patterns of enrolment growth over the next decade, compare these figures with the anticipated capacity of the university system, and then explore some possible implications for university costs. Our examination of various projections of enrolment (based on a continuation of the government policy of responding to social demand) have led us to place most confidence in the projections undertaken by Zsigmond and Wenaas for the Economic Council. Their projections rise to a total of 280,000 full-time students by 1980-81. An analysis of university enrolment projections to 1975-76 indicates a shortfall in places beginning to develop immediately, and reaching a total of about 30,000 full-time undergraduate places by 1975-76. We believe that the Committee on University Affairs ought to give immediate attention to this possibility, to explore various alternatives for meeting this likely demand. Certain of the universities may be prepared to increase their own projections in the light of the likely demand, but in a number of cases this would require supplementary financing.

In the final part of section IV, we have attempted to make a preliminary estimate of the funding implications of the projected demand for university places over the next five years. This was undertaken in order to see whether university needs are likely to represent the unreasonable claim on the resources of government that many public spokesmen have been predicting. While any such cost predictions must be based on a number of assumptions which are susceptible to variation through economic changes and policy changes, we do have confidence in the general order of

magnitude of our estimates in relation to likely available provincial resources. Our general conclusion is that the outlook is not as gloomy as many have believed. The section concludes with a plea that qualitative considerations so necessary to maintain a first class university system not be ignored in planning for the future. We are concerned that continuation of recent levels of unit value increase will jeopardize the ability of the universities of Ontario to meet the challenges of the forthcoming decade.

The concluding section of our brief presents additional specific concerns which will affect university development in the decade ahead. We have undertaken a rough estimate of the future burdens of indirect costs of assisted research, and request CUA's support in making representation to the federal government to cover the full cost of university research which it supports. The other matter dealt with in the final section is the funding of part-time education. We envision this to be a major area of growth in the near future, and propose a careful examination of the structure of the operating grants formula in order to take sufficient account of the needs of part-time education.

II THE DEVELOPMENT OF THE ONTARIO UNIVERSITY SYSTEM IN THE 1960s

The decade of the sixties has been one well described by the Economic Council of Canada as "vigorous educational mobilization." Both government and the universities responded resourcefully to the considerable challenge of vastly increased educational opportunity for the young people of Ontario. In the rapid pace of development which has characterized all regions of Canada, Ontario has maintained a position of preeminence.

A few simple statistics will serve to remind us that the expansion of the Ontario university system in the past ten years has been truly dramatic. In 1960-61, there were just under 29,000 full-time students in the provincially assisted universities. Laurentian and York Universities had just accepted their first students in that year. Brock and Trent Universities and Scarborough and Erindale Colleges had not yet been founded; Guelph and Lakehead Universities had not yet received university charters. Thus prior to the beginning of the decade, only half of the present 16 universities (if we count Scarborough and Erindale Colleges separately) were in existence.

In 1970-71, there are over 111,000 full-time students, an almost fourfold increase over the decade. This growth reflects the compounding effect of increased university-age population and a participation rate which more than doubled over the decade. The rates of growth in full-time graduate and undergraduate enrolment have been virtually identical; in 1960-61 graduate enrolment was 11½% of the total, in 1970-71 it is 12% of total. Accurate comparable statistics on part-time enrolments are not available, but we have estimated part-time winter session enrolment in 1960-61 to have been between 9,000 and 10,000 students, and in

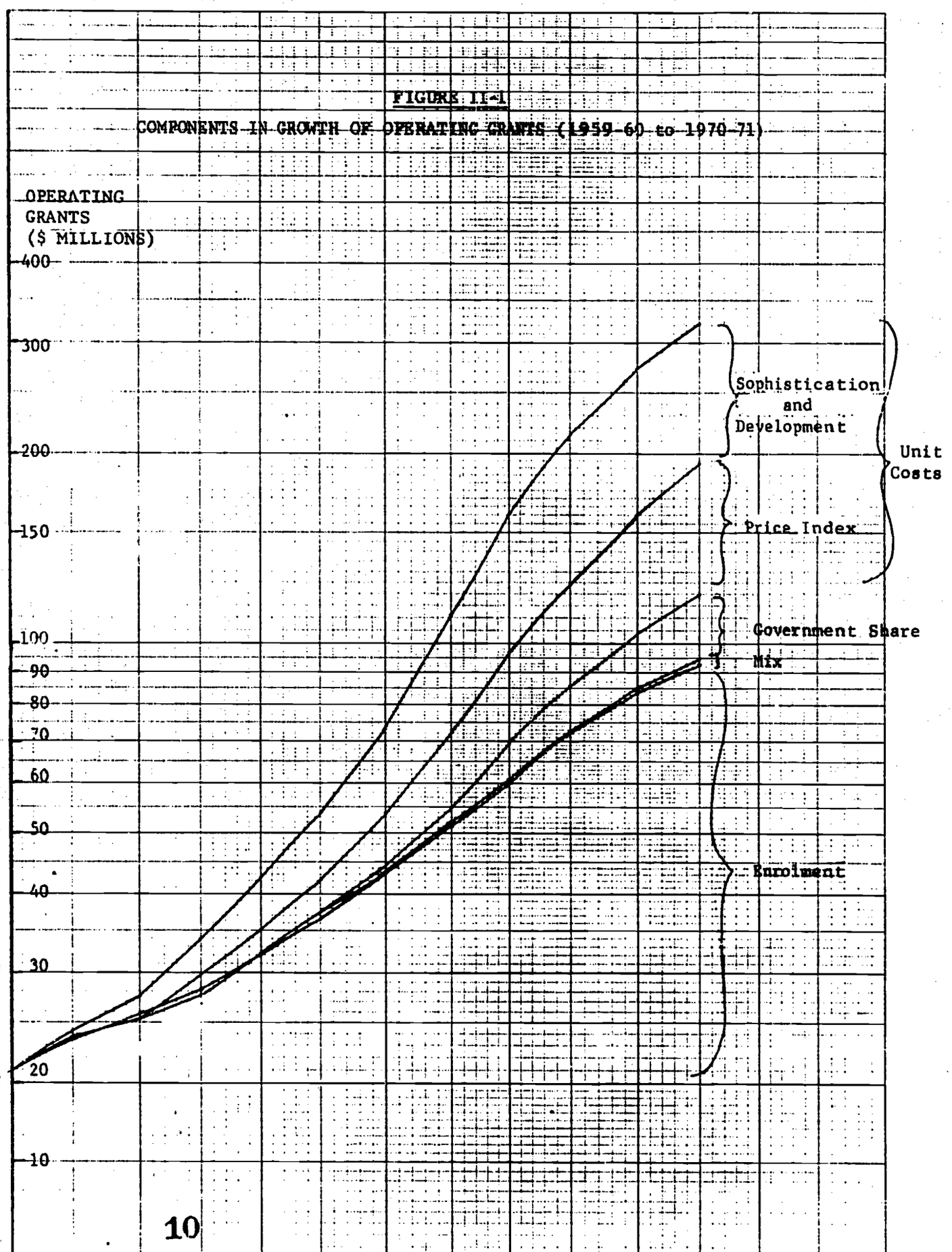
1970-71 to be about 50,000. Part-time enrolments, then, have grown even faster than full-time during the decade.

Data on enrolments by programme of study are most inadequate, but certain general trends can be detected using DBS statistics. Undergraduate enrolment in 1960-61 was about equally divided between arts/science and professional programmes. Enrolment in arts/science programmes has risen much more rapidly than in the applied disciplines. In 1965-66, arts/science enrolment reached 60% of the total, and over the past several years it has stabilized at around 64%. Growth in arts and science has been close-to-linear, and growth in professional programmes has accelerated in the past several years. The pattern has been somewhat different for the graduate sector. Arts and science programmes have accounted for a relatively constant percentage of the total over the decade, about 60% of total enrolments. Within that proportion, there has been a slight shift from science to arts.

Enrolment increases in themselves would have produced dramatic cost increases over the last ten years, but this has been only part of the story, since, while there was a fourfold increase in enrolment over the decade, university operating grants rose thirteenfold. We have analyzed the effects of various factors on the increase in operating grants, and the results are shown diagrammatically in Figure II-1. The graph is drawn in a cumulative fashion, representing the way in which changes in various components affect the total cost. 1959-60 was chosen as a base year, and the subsequent points indicate changes from that year. The bottom sector represents enrolment increases over the period. Next we have the effect of student mix; over the past decade this has affected total cost only marginally. The following factor had a more significant

FIGURE II-1

COMPONENTS IN GROWTH OF OPERATING GRANTS (1959-60) to 1970-71)



effect; government's contribution to total expenditures rose from 68% to 78%.

Unit costs increased significantly, and even when one uses an index of increases in prices of services and goods[1] to account for a portion of the unit cost increase, there is a remainder, which we shall designate as "sophistication and development." This includes the effect of productivity changes (in the economic sense) and the qualitative aspects of change in our educational system which cannot be captured otherwise in the analysis. And here we are faced with a major problem. How do we separate productivity from quality changes, or to put it another way, how do we distinguish between efficiency and effectiveness? Student/faculty ratios of 100:1 would be very "efficient," but would have a substantial negative impact on the effectiveness of instruction, and therefore the quality of the university product.

One aspect of the development of Ontario's university system during the decade had a major effect on unit costs. Figure II-2 shows that unit costs rose slowly in the earlier part of the decade, surged for several years in the middle, and have begun to level off more recently. This is due in large part to the impact of doubling the number of university institutions and expansion of programmes in existing institutions, the major cost effects of which were seen in the middle years of the decade. As new institutions and programmes are filling up to capacity, their unit costs are decreasing markedly. This scale phenomenon, along with the low levels of unit-value increase under the

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[1] The GNP implicit price index for government current expenditure on goods and services was used as a proxy in the absence of a direct measure of the effects of inflation on university costs. This index rose at an average rate of 5½% per annum over the decade.

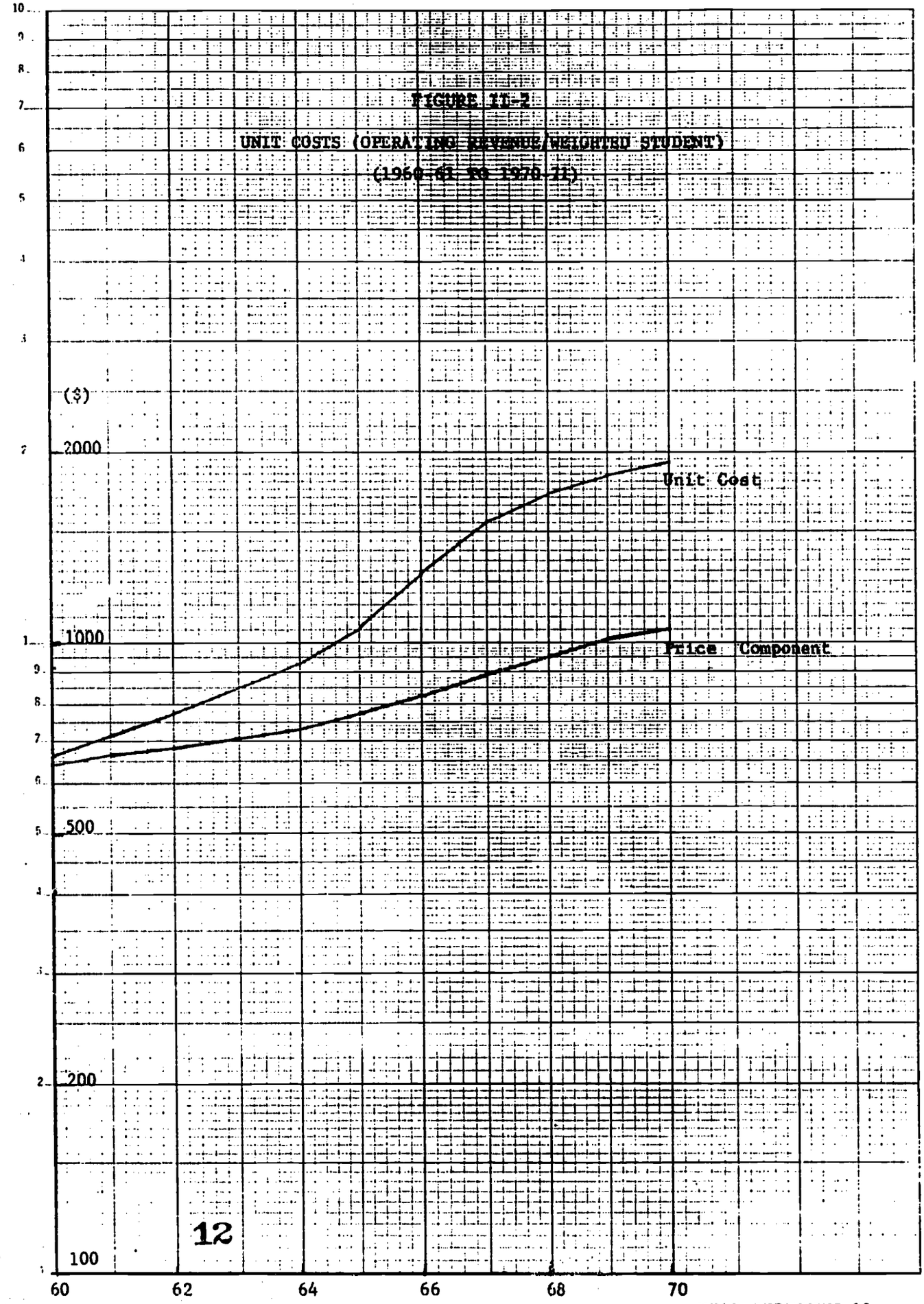
FIGURE II-2
UNIT COSTS (OPERATING REVENUE/WEIGHTED STUDENT)
(1960-61 TO 1970-71)
($)
2000
1000
500
200
100
Unit Cost
Price Component
60
62
64
66
68
70
YEAR BEGINNING 19
SEMI-LOGARITHMIC
46 4970

formula system for the last several years, has contributed to the recent flattening-off.

There are a number of other significant factors which have contributed to cost increases, but which are not easily quantified. One must consider the qualitative changes that have taken place in our universities. The knowledge explosion, along with the increasing use of technology in the learning process, has led to greatly increased sophistication of the universities' enterprises in all areas - teaching, research, community services. This increasing sophistication, which is one aspect of quality, has involved cost increases. For instance, the knowledge explosion has obvious implications for library costs. The past decade saw the emergence of the computer into a central role in the pursuit of knowledge - a very expensive role. Various applications of technology in teaching have enhanced the quality of instruction and on the whole led until now to cost increases rather than savings. There is no way that universities, as the major intellectual institutions of a society, could have kept up with the rapid pace of knowledge and technology without substantial unit cost increases.

Costs of research should also be mentioned in a different sense. The volume of assisted research in universities has increased enormously, and under the policies of most granting agencies, substantial associated overheads have had to be borne by the universities. Assisted research in Ontario universities has grown from $6.3 million in 1959-60 to over $46 million in 1969-70, a compound annual growth rate of 22%. If one accepts the estimates of the Macdonald Report on the magnitude of overhead costs (35% of the value of grants), in 1969-70 the "fiscal drag" created by assisted research in Ontario universities was over $16 million.

This is equal to 4.6% of operating expenditures and 6.2% of operating grants. While the inextricable links between research and teaching (particularly at the graduate level) mean that the universities have derived great benefits from the expansion of research, it is clear that the benefits have carried with them major implications for the growth of costs which must be borne from university funds. We return to this problem again in a subsequent section.

Other factors might be mentioned. As well as the establishment of new institutions, the decade has seen a great expansion in programme and course offerings. Although it might be fashionable to attach the designation "proliferation" to this development, we suggest it might also be viewed as an expansion of the quality of educational opportunity in Ontario, albeit costly. The 1960s have also seen substantial improvement in the qualifications and salaries of academic staff. The salary trend has been part of a general "catching-up" process which has been characteristic of the service sector of the economy over the past few years.

This, of course, is not a comprehensive list of the changes with cost implications which have taken place over the past decade. It should serve to illustrate, however, how complex is the business of evaluating unit costs, and how dangerous is any simple application of efficiency concepts to the educational process. The problem with "unit" costs as a vehicle for historical analysis is that the unit is not constant over time.

While not minimizing the extraordinary growth in costs over the past decade, we do think that the record of the Ontario universities in the sixties is creditable, to both the universities and to government.

Ten years ago, with several notable exceptions, Ontario had not universities but colleges. The decade has seen a number of universities created out of colleges, and a number more created out of nothing. To do this, Ontario has had to be competitive on the international market of scholarship. There is no escaping major cost implications of such development. The growth in costs which we have observed reflects a period of extraordinary accomplishment, qualitative as well as quantitative.

III THE IMPACT OF FINANCING LEVELS FOR 1970-71 AND 1971-72

As in past briefs, in this section we examine, somewhat more briefly than previously, certain quantitative indicators of the distribution of university operating resources. A year to year examination of these indicators enables us to ascertain whether there are any notable trends in the distribution of resources, in particular to what extent there may be trade-offs taking place. In this section we examine for 1970-71 budgeted figures on staff/income unit ratios and operating expenditures, and present summary statistics on academic salaries.

III-A Staff/Income Unit Ratios in 1970-71

Table III-A-1 shows several statistics relating to numbers of faculty and income units from 1968-69 to 1970-71 in the emerged universities. The figures for 1970-71 are budgeted, while the previous ones are actual. As we did last year, we have calculated these figures with two different groupings subsequent to 1968-69, in order to isolate the effect of including Guelph and York in the emerged grouping subsequent to 1968-69. Examination of ratios of both full-time staff and full-time equivalent staff to income units over the three years, will illustrate that the ratios have remained constant (within a range of expectable random fluctuation from year to year). It is clear that although the universities have been in a marked budgetary squeeze for 1970-71, they expect to be able to prevent a deterioration in faculty/income unit ratios.

Table III-A-2 shows comparable statistics for the emerging institutions. For the latter two years, we have incorporated for the first time statistics of Algoma and Nipissing Colleges. Both full-time staff and full-time equivalent staff to income unit ratios for the same group of institutions (six) took a marked jump in 1969-70 over 1968-69, and are expected to remain at the same level in 1970-71.

STAFF/INCOME UNIT RATIOS FOR THE EMERGED UNIVERSITIES

	1968-69 Actual	1969-70 Actual	1970-71 Budgeted
Full-time Staff			
Eight Institutions	4899.7	5,625.1	6,107.4
Ten Institutions*	-	6,690.1	7,306.5
Full-time Equivalent Staff #			
Eight Institutions	5463.2	6,307.4	6,861.8
Ten Institutions*	-	7,472.7	6,174.3
Income Units			
Eight Institutions	133,028.7	153,621.0	167,627.6
Ten Institutions*	-	179,760.1	198,782.6
F.T. Staff/Income Unit Ratio			
Eight Institutions	1:27.2	1:27.3	1:27.4
Ten Institutions*	-	1:26.9	1:27.2
F.T.E. Staff/Income Unit Ratio			
Eight Institutions	1:24.3	1:24.4	1:24.4
Ten Institutions*	-	1:24.1	1:24.3

* Including Guelph and York.

Includes full-time staff and F.T.E. of part-time staff (calculated by dividing total salaries paid to part-time staff by the average full-time salary for each university).

TABLE III-A-1

STAFF/INCOME UNIT RATIOS FOR THE EMERGING UNIVERSITIES

	1968-69 Actual	1969-70 Actual	1970-71 Budgeted
Full-time Staff			
Six Institutions	616.4	693.9	839.0
Eight Institutions	1513.9*	713.9**	868.0**
Full-time Equivalent Staff #			
Six Institutions	703.1	807.6	953.4
Eight Institutions	1661.7*	834.5**	987.9**
Income Units			
Six Institutions	10,088.8	13,881.5	16,939.5
Eight Institutions	30,425.6*	14,480.0**	17,881.5**
F.T. Staff/Income Unit Ratio			
Six Institutions	1:16.4	1:20.0	1:20.2
Eight Institutions	1:20.1*	1:20.1**	1:20.6**
F.T.E. Staff/Income Unit Ratio			
Six Institutions	1:14.3	1:17.2	1:17.8
Eight Institutions	1:18.3*	1:17.4**	1:18.1**

* Including Guelph and York
** Including Algoma and Nipissing; excluding Guelph and York.
# Includes full-time staff and F.T.E. of part-time staff (calculated by dividing total salaries paid to part-time staff by the average full-time salary for each university).

TABLE III-A-2

For the entire Ontario system, the full-time equivalent staff to income ratio unit in both 1968-69 and 1969-70 was 1:23.4 and in 1970-71 is estimated at 1:23.6. Taking full-time staff only, the 1968-69 ratio was 1:26.0, in 1969-70 was 1:26.2, and in 1970-71 is estimated at 1:26.5.

III-B Budgeted Operating Expenditures for 1970-71

In the preparation of previous briefs, we have felt very keenly the inadequacy of existing financial statistics on university operations. There have been problems in comparability of data as a result of somewhat different categorizations of expenditures utilized by different universities. These differences derive in part from differing academic and administrative structures, and therefore the achievement of greater comparability is not an easy task. In addition, categorizations used in the past have been sufficiently crude that a detailed appreciation of what is really happening in the university budgets has been difficult to achieve.

CPUO is committed to achieving more satisfactory financial reporting of university activities, and the staff of the Research Division have been active during the year in collaboration with the university financial officers to this end. Extensive discussions with the finance officers have revealed, however, that any substantial improvement of university financial reporting will require some time to attain. Many of the problems have been identified, but their resolution cannot be quickly accomplished. We have had to rely as in the past on CAUBO/DBS financial returns, but in the future will have more useful breakdowns. A trial set of improved forms has been designed and will be put into use over the forthcoming year.

Budgeted operating expenditures by broad categories of expense, as percentages of the total, are presented in Table III-B-1 for 1970-71 with comparisons to 1969-70 and 1968-69 actuals. The 1970-71 data do not include the University of Windsor, for which information was not available in time. The emerging universities are also not included in this table.

Caution must be taken in interpreting Table III-B-1 since certain shifts invariably take place between budgeted and actual expenditures, and our 1970-71 figures are budgeted while those for the preceding years are actuals. This caution particularly applies to the percentage devoted to academic salaries, since it is often difficult to predict hirings precisely. It appears that the percentage devoted to academic salaries will increase somewhat in 1970-71, but we must bear this caution in mind. Last year we noted a substantial drop in the percentage devoted to the purchase of books and periodicals. Expenditures for books and periodicals accounted for 3.6% of the expenditures of the emerged universities in 1968-69, only 3.1% in 1969-70, and are expected to drop to 2.6% of the total in 1970-71. Library expenditures are somewhat more discretionary items than many. Such expenditures can be "deferred" in ways which, for instance, maintenance or even purchases of routine supplies cannot. Library and academic support expenditures are often the first to suffer in a period of financial stringency.

Physical plant expenditures rose from 12.7% in 1968-69 to 14% in 1969-70. Universities have been reporting over the past several years that they were unable to spend a desirable amount on maintenance; these expenditures cannot be deferred indefinitely. Last year's anticipated actual figures showed 12.2% budgeted for maintenance but it actually reached 14%; similarly, more than the 13% budgeted for 1970-71 may actually be required.

BREAKDOWN OF COMPONENT EXPENSES AS PERCENTS OF TOTAL
FROM 1968-69 TO 1970-71
FOR THE EMERGED UNIVERSITIES

	Actual 1968-69		Actual 1969-70		Budgeted 1970-71	
	$ (000's)	%	$ (000's)	%	$ (000's)	%
Academic Salaries	84,857	40.5	121,358	40.5	140,103	42.0
Support Staff Salaries	23,509	11.2	35,207	11.7	39,240	11.8
Library Staff Salaries	9,152	4.4	12,308	4.1	13,885	4.2
Books and Periodicals	7,524	3.6	9,315	3.1	8,561	2.6
Fringe Benefits	7,847	3.7	12,703	4.2	14,504	4.3
Other Academic Expenses	25,860	12.4	35,279	11.7	39,299	11.8
Subtotal	158,749	75.8	226,170	75.4	255,592	76.6
Administration	14,555	7.0	20,482	6.8	23.336	7.0
Physical Plant	26,526	12.7	42,069	14.0	43,523	13.0
Miscellaneous	9,543	4.5	11,125	3.7	11,229	3.4
Subtotal	50,624	24.2	73,676	24.6	78,088	23.4
TOTAL	209,373	100.0	299,846	100.0	333,680	100.0

TABLE III-B-1

Overall, there have been no major shifts between categories of expenditure in the last couple of years. We have commented on past occasions on the budgetary squeeze faced by the universities, and do not propose to comment on this continuing problem at length on the present occasion, since the arguments are well known. The squeeze will get tighter, as long as the universities continue to receive increases in unit value which are substantially below general levels of salary increases. The universities are a part of an economy where salary increases continue at a high level. Although the government has succeeded in substantially lowering the rate of inflation in consumer prices over the past year, this has had little, if any, effect on salary settlements, which continue to run at eight to nine percent per annum. These pressures are felt on both academic and non-academic salaries, which account (with fringe benefits) for over 75% of university budgets. Such a discrepancy between unit value increases and cost pressures, if continued for more than a year or two, will unquestionably have deleterious consequences on university effectiveness.

III-C Academic Salaries in 1970-71

In last year's brief, we presented arguments for an increase in the salary portion of university budgets of 11.4%. This increase when combined with cost increases in other areas would have required an increase in the basic income unit of 9.13%. It was not, of course, possible to meet the 11.4% salary budget objective with the subsequently announced 6.0% increase in income unit value.

Table III-C-1 presents a comparison of average salaries of full-time academic staff in 1970-71 with the preceding year. The increase in average salary was 8.2%, a level identical to the preceding year. With the exception of certain ranks which exist only in faculties

TABLE III - C-1

AVERAGE SALARIES OF FULL-TIME ACADEMIC STAFF
IN ONTARIO UNIVERSITIES

	1969-70		1970-71		
	Number In Rank	Average Salary	Number In Rank	Average Salary	% Increase
Dean	119.6	25,432	117.6	27,909	9.7
Professor (with Admin. Duties)	363.4	22,710	365.9	24,791	9.2
Professor (without Admin. Duties)	1,127.6	20,564	1,258.1	22,378	8.8
Associate Professor	1,833.5	15,395	2,029.7	16,584	7.7
Assistant Professor	2,490.0	12,134	2,713.7	13,119	8.1
Lecturer	831.3	9,918	910.3	10,661	7.5
Instructor	187.2	8,312	183.4	8,907	7.2
Lecturer & Instructor*	63.1	9,472	79.3	11,051	16.7
Geographical Full-Time*	452.9	18,322	488.0	19,887	8.5
TOTAL	7,468.6	14,945	8,145.9	16,166	8.2

SOURCE: 1969-70 and 1970-71 UA1 anticipated actual submissions to the Department of University Affairs. Data were not available for Algoma and Nipissing.

* These categories only apply to Medicine.

of medicine, increases by rank varied between 7.2% for instructors and 9.7% for deans. Such increases do not appear to us to be out of line with continuing trends in other sectors of the economy.

The universities were pleased to have for the first time last spring, a two-year indication of basic income unit values. This has meant that preliminary budgets for 1971-72, which are begun in the fall of 1970, can be developed on a more realistic basis than previously. This is particularly the case with respect to academic salaries, for it is now possible for salary discussions to be conducted in the light of likely funding levels. This is an advantage to both administrative and faculty representatives participating in salary discussions. It also will enable the universities to meet the desires of faculty members to have earlier salary settlements.

We hope that the practice of two-year announcements will be maintained, on a rolling basis, so that universities will continue to have knowledge of likely resources a year in advance.

IV A LOOK AHEAD TO 1980

In this section we look first at probable patterns of enrolment growth over the next decade, compare these figures with the anticipated capacity of the existing university system, and then explore some possible implications for university costs. One has only to contemplate how good a similar projection undertaken in 1960 would look today to realize what a risky business this is. Nonetheless, it is essential that we plan immediately for what will be the likely situation in 1975, and look in a general way towards 1980.

IV-A Anticipated Patterns of Enrolment Growth in the 1970s

We examine now various available projections of university enrolment and give our own views on the likely magnitude of enrolment growth. These views have been based on the premise of a continuation of existing government policies of responding to social demand. Policy changes could of course alter the picture. The "open-door" policy will be the key to cost levels in the forthcoming decade, and this is a matter of public policy for government determination.

Table IV-A-1 shows estimates of total full-time enrolment in Ontario from 1968-69 to 1980-81. Two of these projections were taken from the 1968 OISE publication entitled Ontario University and College Enrolment Projections to 1981-82 by Cicely Watson and Saeed Quazi (hereinafter termed "OISE"). The two OISE projections shown represent the upper and lower bounds of four alternative totals of full-time enrolment projections offered by the authors. The third projection is that undertaken by Zsigmond and Wenaas for the Economic Council of Canada, Enrolment in Educational Institutions by Province, 1951-52 to 1980-81 (hereinafter termed "EC").

TOTAL FULL-TIME PROJECTED ENROLMENT (000's)

Year	(1) OISE #1B	(2) OISE #2A	(3) Teachers# Colleges	(4) OISE #1B Including Teachers	(5) OISE #2A Including Teachers	(6) Economic Council	(7) Compensated Actual Plus Teachers
68-69	88.9	91.0	10.9	99.8	101.9	101.9	103.5
69-70	100.9	104.2	12.0	112.5	116.2	114.0	117.2
70-71	112.1	117.1	11.5	123.6	128.6	124.8	130.0*
71-72	123.9	129.5	8.5	132.4	138.0	137.4	-
72-73	135.2	140.4	9.7	144.9	150.1	153.0	-
73-74	146.5	152.1	9.7	156.2	161.8	167.5	-
74-75	156.8	165.6	9.3	166.1	174.9	186.0	-
75-76	166.3	178.8	10.1	176.4	188.9	202.7	-
76-77	175.4	192.4	10.9	186.3	203.3	217.9	-
77-78	183.2	205.8	11.7	194.9	217.5	234.7	-
78-79	190.8	218.0	12.4	203.2	230.4	248.0	-
79-80	198.2	229.8	13.3	211.5	243.1	266.0	-
80-81	205.6	239.8	14.0	219.6	253.8	280.0	-

The Teacher Education Branch, Department of Education, has projected a levelling-off of the demand for new teachers from teachers' colleges to just over 8000 from 1971-72 on. However, we anticipate some increase in this level as a result of demand for improvement in teacher/pupil ratios, particularly at the elementary level.

* Anticipated actual.

All of these projections are based on historical enrolment statistics from the Dominion Bureau of Statistics, which include students in other than the provincially assisted universities. Adjustments must therefore be made before these figures can be compared with those available from the Department of University Affairs. Since it seems reasonable to project the total provincial enrolment in the first instance, on subsequent pages wherever a comparison between DUA and DBS statistics becomes necessary, the DUA figures have been adjusted upwards by an appropriate factor. In addition, EC projections, unlike the OISE, include enrolment in teachers' colleges with the university enrolments from 1968-69 onwards. Since teacher education is in the process of being integrated into the universities, we have added the estimated enrolment of teachers' colleges to both of the OISE projections rather than subtracting them from the EC's.

The resulting comparisons in columns (4) to (6) of Table IV-A-1 show a full-time enrolment anywhere from 220,000 to 280,000 in 1980-81. It is apparent that EC expects a faster rate of growth than that assumed in the highest OISE projection. In the five-year period 1970-71 to 1975-76, EC expects average enrolment increases of about 12% per annum versus average increases of 9% per annum for the higher of the two OISE projections. In the following five-year projection period (1975-76 to 1980-81), EC expects average enrolment increases of about 7% per annum versus average increases of slightly less than 7% per annum for the higher OISE projection. Thus, the major difference is the higher growth rate of the EC projection in the first five-year period.

Which of the three projections is most deserving of our confidence? One approach to answering this question is to compare the actual enrolment in 1968-69 and 1969-70 with these projections which were undertaken in 1967 and 1968. The DUA full-time enrolment figures for the Ontario universities in these two years are 88,448 and 101,393[1/]. If we include the enrolment in those institutions covered by the DBS statistics, these figures become 92,625 and 105,235. If, in addition, the enrolment in teachers' colleges are included, the figures become 103,525 for 1968-69 and 117,235 for 1969-70. Thus the actual full-time enrolment in Ontario has already exceeded all three estimates, with an annual growth rate over the past two years of 13.2%. This 13.2% growth rate lends more weight to the EC 12% than the OISE 9% over the next five-year period, even if we expect a slow decrease in enrolment growth from year to year. It might also be noted that the anticipated actual returns suggest a growth rate for 1970-71 over the preceding year of 11%.

The main reason for the divergence of enrolment from the EC and OISE projections for these years is the assumed participation rate of the 18-24 age group which has averaged a 10% increase per year, having increased from 9.0% in 1965-66 to 13.6% in 1970-71. OISE has assumed that the average growth in the participation rate for the period 1970-71 to 1975-76 would be about 6% while EC expects it to be a little over 7%. Based on the actual growth rate of the past few years, it would seem that EC's assumed participation rate is more realistic. The EC estimates assume an increase in participation rate from 13.6% in 1970-71 to 18.9% in 1975-76 and 22.8% in 1980-81.

It can hardly be over-emphasized how sensitive these projections are to the participation rate assumed. It is our opinion, firstly, that the

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1/ Waterloo Lutheran, the Ontario College of Art and the Royal Military College of Canada have been excluded.

EC estimate is more likely to hold in the future than the OISE estimate, and secondly, that even this may well be an underestimate rather than an overestimate of social demand.

Table IV-A-2 shows EC and OISE enrolment projections disaggregated into full-time undergraduate, full-time graduate, and FTE of part-time. A comparison of these projections with actual enrolment in 1969-70 can be made. Actual full-time undergraduate enrolment in 1969-70 has already exceeded the higher OISE estimate by about 7% and the EC estimate by 3%. In the case of full-time graduate enrolment, OISE proved to have overestimated for 1969-70, for the actual enrolment of 13,700 was projected by OISE to be 15,100 while EC projected 13,500 for the same year. Although EC's estimate is significantly less than that of OISE in the early years of the projection period because of its higher growth rate, the projections converge and agree quite closely by 1980-81. For part-time enrolment, only EC estimates are available, and these represented an underestimate of about 13% in 1969-70. The actual growth rates between 1968-69 and 1969-70 for full-time undergraduate, full-time graduate and FTE of part-time were 12.5%, 19% and 9.7% respectively.

IV-B The Anticipated Capacity of the Existing University System to 1975-76

We shall assume that the capacity of the university system in any given year is determined by the forecasts of enrolments made by the universities five years earlier and thus the capacity in 1975-76 will be determined by the 1970-71 university forecasts. (We have not projected capacity beyond 1975-76 since university forecasts are not available.) This is so because capital monies are allocated on the basis of these rolling five year university forecasts using a capital formula. Thus, if

PROJECTED AND ACTUAL FULL-TIME UNDERGRADUATE, FULL-TIME GRADUATE AND FTE OF PART-TIME ENROLMENT

(Thousands)

	Full-time Undergrad.			Full-time Graduate			FTE of Part-Time	
Year	OISE #8A +Teachers Colleges	Economic Council	Compensated Actual +Teachers	OISE #A	Economic Council	Compensated Actual	Economic Council	Compensated Actual
68-69	87.9	90.4	92.0	13.2	11.5	11.5	12.6	15.5
69-70	96.8	100.5	103.5	15.1	13.5	13.7	15.0	17.0
70-71	104.4	109.2	-	17.1	15.6	-	16.6	-
71-72	110.4	120.0	-	19.4	17.4	-	18.4	-
72-73	121.4	133.8	-	21.9	19.2	-	20.6	-
73-74	131.0	145.8	-	24.5	21.7	-	22.7	-
74-75	141.4	162.2	-	27.5	23.8	-	25.4	-
75-76	151.1	176.3	-	30.2	26.4	-	27.8	-
76-77	160.6	188.6	-	32.9	29.3	-	29.9	-
77-78	170.0	201.3	-	35.8	33.4	-	32.3	-
78-79	177.4	210.3	-	38.9	37.7	-	34.2	-
79-80	185.9	225.4	-	41.8	40.6	-	36.7	-
80-81	194.7	236.4	-	44.8	43.6	-	38.5	-

TABLE IV-A-2

there are no significant changes in the form or the parameters of the capital formula, and if no universities are in a space debit condition at the end of the period, the universities' five year projections of enrolment should closely approximate the physical capacity of the system five years later. The question then becomes, what is the forecast enrolment for 1975-76? The answer to this question is available in part by summing the estimates given in the 1970-71 university briefs to CUA but it will also be affected by the pace of integration of teachers' colleges with the universities before 1975-76. The analysis below has excluded projected teachers' college enrolments. Thus, the capacity of the Ontario system in 1975-76 will be 130,825 undergraduate, 20,515 graduate, and 25,364 FTE of part-time students. To these must be added the expected enrolments of the teachers' colleges. Official forecasts for the teachers' colleges are available only up to 1972-73. These forecasts suggest that the enrolment in teachers' colleges is likely to decrease in the near future. Furthermore, when these enrolments are expressed as a percentage of the projected total full-time university enrolment in the Province (as given by the Economic Council) the percentage drops by a little over one percentage point from 1969-70 to 1970-71 and this is followed by a sharp 3% drop in the following year. Thereafter the rate of decrease begins to level off. We shall assume that this percentage will continue to level off and remain at 5% from 1974-75 onwards when the teachers' colleges will be fully integrated with the universities.

It is of interest to speculate on how the projected enrolment levels in 1975-76 might be distributed with respect to broad discipline groupings.

The discipline groupings employed are those used by DBS and are defined as follows:

1. Arts 2/
2. Pure Science
3. Applied Social Sciences - Commerce and Business Administration, Household Science, Law, P.H.E., Secretarial Science, Social Work
4. Applied Physical Sciences - Architecture, Engineering
5. Applied Biological Sciences - Agriculture, Dentistry, Forestry, Nursing, Optometry, Pharmacy, P.O.T., Veterinary Science
6. Applied Humanities - Fine Art, Journalism, Library Science, Music, Theology
7. Medicine
8. Education

The actual distributions were calculated from DBS data for the last seven years. These percentages are shown in Tables IV-B-1, 2 and 3 for full-time undergraduate, part-time undergraduate and FTE of part-time enrolment.

It is readily apparent for example that while the full-time undergraduate enrolment percentage in Arts and Pure Science is reasonably stable, there have been definite decreases in Applied Physical Sciences, Applied Biological Sciences and Medicine and increases in Education, Applied Social Sciences and Applied Humanities. The rightmost column of Tables IV-B-1, 2, and 3 contain best-guess percentage distributions that will obtain in 1975-76.

The 1975-76 best-guess percentage distributions were applied to the Economic Council full-time undergraduate, full-time graduate and FTE of part-time enrolment projections to give the projected enrolment "demand"

2/ Enrolments in "Arts" are as designated by the universities reporting to DBS. It appears that in the case of undergraduate enrolments, but not graduate, this category in fact represents arts and science for most universities. The pure science category would be accounted for by those universities which have separate faculties of science.

PERCENTAGE DISTRIBUTION OF DISCIPLINE GROUPS
FULL-TIME UNDERGRADUATE

Discipline Groups	63-64	64-65	65-66	66-67	67-68	68-69	69-70	Estimated 75-76
Arts	41.4	43.3	46.1	46.4	46.9	47.6	46.6	47.0
Pure Science	13.1	13.9	14.7	16.3	17.0	16.8	16.7	16.0
Subtotal	54.5	57.2	50.8	62.7	63.9	64.4	63.3	63.0
Applied Phys. Sciences	13.7	13.2	13.1	12.7	12.2	11.6	10.9	10.0
Applied Social Sci.	12.4	11.4	10.7	10.6	10.8	11.0	11.3	11.0
Applied Bio Sciences	9.8	9.0	7.5	6.8	6.1	5.6	5.7	7.0
Applied Humanities	2.6	2.4	1.8	1.8	1.9	2.0	3.0	5.0
Education	2.1	2.1	2.0	1.9	1.9	2.7	3.5	3.0 *
Medicine	4.9	4.5	4.1	3.5	3.2	2.6	2.2	1.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Excludes teachers' colleges in 1975-76.

TABLE IV - B-1

PERCENTAGE DISTRIBUTION OF DISCIPLINE GROUPS
FULL-TIME GRADUATE

Discipline Groups	63-64	64-65	65-66	66-67	67-68	68-69	69-70	Estimated 75-76
Arts	35.6	38.8	41.1	37.6	37.4	37.2	37.2	38.0
Pure Science	24.7	24.6	25.1	25.6	24.8	24.7	23.3	21.0
Subtotal	60.3	63.4	66.2	63.2	62.2	61.9	60.5	59.0
Applied Physical Sci.	12.7	13.6	13.4	15.0	14.9	15.2	13.8	12.0
Applied Social Sci.	10.3	9.4	9.1	9.4	9.5	10.0	12.4	14.0
Applied Bio Sciences	4.7	4.5	3.8	3.5	3.1	4.3	3.0	5.0
Applied Humanities	2.4	1.6	0.6	0.7	0.5	0.5	2.2	3.0
Education	1.4	1.6	1.7	2.5	3.4	3.8	4.1	5.0
Medicine	8.4	5.8	5.1	5.8	6.4	4.3	4.1	2.0
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE IV - B-2

PERCENTAGE DISTRIBUTION OF DISCIPLINE GROUPS
TOTAL PART-TIME (HEAD COUNT)

Discipline Groups	63-64	64-65	65-66	66-67	67-68	68-69	69-70	Estimated 75-76
Arts	80.3	82.7	83.3	83.0	78.7	81.8	77.8	78.0
Pure Science	1.7	1.3	2.2	3.1	4.0	4.6	5.3	5.0
Sub-total	82.0	84.0	85.5	85.1	82.7	86.4	83.1	83.0
Applied Physical Sci.	1.2	1.1	1.2	1.4	1.7	1.5	1.6	1.0
Applied Social Sci.	11.2	10.0	8.6	7.6	10.0	6.8	6.6	6.0
Applied Bio Sciences	1.0	1.2	1.2	1.9	1.2	1.0	1.2	1.2
Applied Humanities	0.8	0.9	0.7	0.7	0.9	0.8	0.8	0.7
Education	3.6	2.7	2.7	3.3	3.5	3.4	6.6	8.0
Medicine	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE IV - B-3

by discipline grouping in 1975-76. The anticipated supply of space by discipline grouping was obtained by applying the same best-guess distributions to the adjusted university enrolment forecasts[3/]. (See Table IV-B-4.)

Thus, we estimate that by 1975-76, if participation rates follow recent trends (i.e. the "open-door" policy is continued), there will be an unfilled demand for 30,100 full-time undergraduate student places, almost half of these being in Arts and Science. Even in Pure Science, which has been projected to be on the decrease, there will be an unfilled demand for 4,800 student places. About 17% of the total full-time undergraduate student demand would remain unsatisfied in 1975-76. For full-time graduate and part-time students, we estimate the excess of demand over capacity in 1975-76 to be 5,800 and 2,400 FTE (about 7,200 head-count) students respectively.

The dimensions of this anticipated shortfall in student places may be appreciated by visualizing that the numbers would represent the equivalent of a university larger than the University of Toronto being created within the next five years. It also might be noted that although we have presented a supply/demand comparison only for 1975-76, a deficit begins to appear in 1971-72 and grows steadily thereafter.

Various policy changes could alter these totals significantly. We are cognizant that such concerns will be under the purview of the Commission on Post-Secondary Education in Ontario, to whom we shall be making representations concerning various possible alternatives. The above estimates represent our view of the number of students desirous of entry to university and capable of meeting university entrance requirements, and of the excess demand over capacity according to present university forecasts of the number of available places. We believe that the Committee on University Affairs ought to give immediate

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3/ The university undergraduate forecasts were multiplied by 1.038 to make them comparable with DBS statistics which included Waterloo Lutheran, Regis College, the Ontario College of Art and the Royal Military College.

ESTIMATED DEMAND FOR AND SUPPLY OF STUDENT PLACES IN 1975-76

(Thousands)

		Full-Time Undergrad.	Full-Time Graduate	FTE of Part-Time
Arts	Demand	82.9	10.0	21.7
	Capacity	68.7	7.8	19.8
	Difference	14.2	2.2	1.9
Pure Science	Demand	28.2	5.5	1.4
	Capacity	23.4	4.3	1.3
	Difference	4.8	1.2	0.1
Applied Physical Science	Demand	17.6	3.2	0.3
	Capacity	14.6	2.5	0.3
	Difference	3.0	0.7	0.0
Applied Social Science	Demand	19.4	3.7	1.7
	Capacity	16.1	2.9	1.5
	Difference	3.3	0.8	0.2
Applied Biological Science	Demand	12.3	1.3	0.3
	Capacity	10.3	1.0	0.3
	Difference	2.0	0.3	0.0
Applied Humanities	Demand	8.8	0.8	0.2
	Capacity	7.3	0.6	0.2
	Difference	1.5	0.2	0.0
Education	Demand	5.3 *	1.3	2.2
	Capacity	4.4	1.0	2.0
	Difference	0.9	0.3	0.2
Medicine	Demand	1.8	0.5	0.0
	Capacity	1.5	0.4	0.0
	Difference	0.3	0.1	0.0
TOTAL	Demand	186.4*	26.3	27.8
	Capacity	156.3	20.5	25.4
	Difference	30.1	5.8	2.4

* Teachers' college enrolments of 10,100 added in separately.

TABLE IV-B-4

attention to the supply and demand of university places, particularly at the undergraduate level.

It may be that certain universities, when they become aware of this potential demand, would be prepared to revise their own forecasts. The consultation process to take place between universities as part of the recently agreed-upon procedures for enrolment forecasting should facilitate some adjustments to anticipated demand. In certain cases where this would be possible, however, it would involve creation of new campus sites. Supplementary developmental financing would be required in the immediate future in order to meet anticipated demand in 1975-76.

We should stress that these are university places for which requirements have been estimated. There is no indication that the rapid expansion of other post-secondary opportunities in the past several years has had any significant effect in reducing the demand for university places. Nor do we expect this to be the case in the forseeable future. Also, it is not evident that even if such a shift were possible, the cost savings would be significant. Many CAAT programmes are more expensive than undergraduate Arts and Science programmes in universities.

IV-C Cost Implications of University Development

We have used the analysis by component method described in part II to make a very preliminary estimate of the order of magnitude of the costs which would be associated with meeting enrolment demand in the next decade. For a first approximation, it appears reasonable to extrapolate existing policies and recent trends. Many policy changes, especially any alteration of policies governing the percentage of total cost borne by government and alterations of unit value to provide qualitative improvement, would change the picture. Nonetheless, the projection undertaken in this section should provide a baseline estimate against which we can evaluate the ability of government to meet the costs. In particular, we assume (a) that the Economic Council estimates of enrolment are valid, (b) that the effect of the student mix will remain the same proportionately over the next decade (in any case its effect is almost negligible), (c) that the average increase in the price of services and goods in universities over the next decade will be equal to that of the past decade (5½% per annum), and (d) that the public share of the total operating costs of the universities will creep up slowly from 77.5% to 82.5% over the decade (as a result of holding fees constant).

Under these assumptions, university operating revenues would increase from $447 million in 1970-71 to $768 million in 1975-76. University operating grants would rise from $346 million to $614 million.[4]

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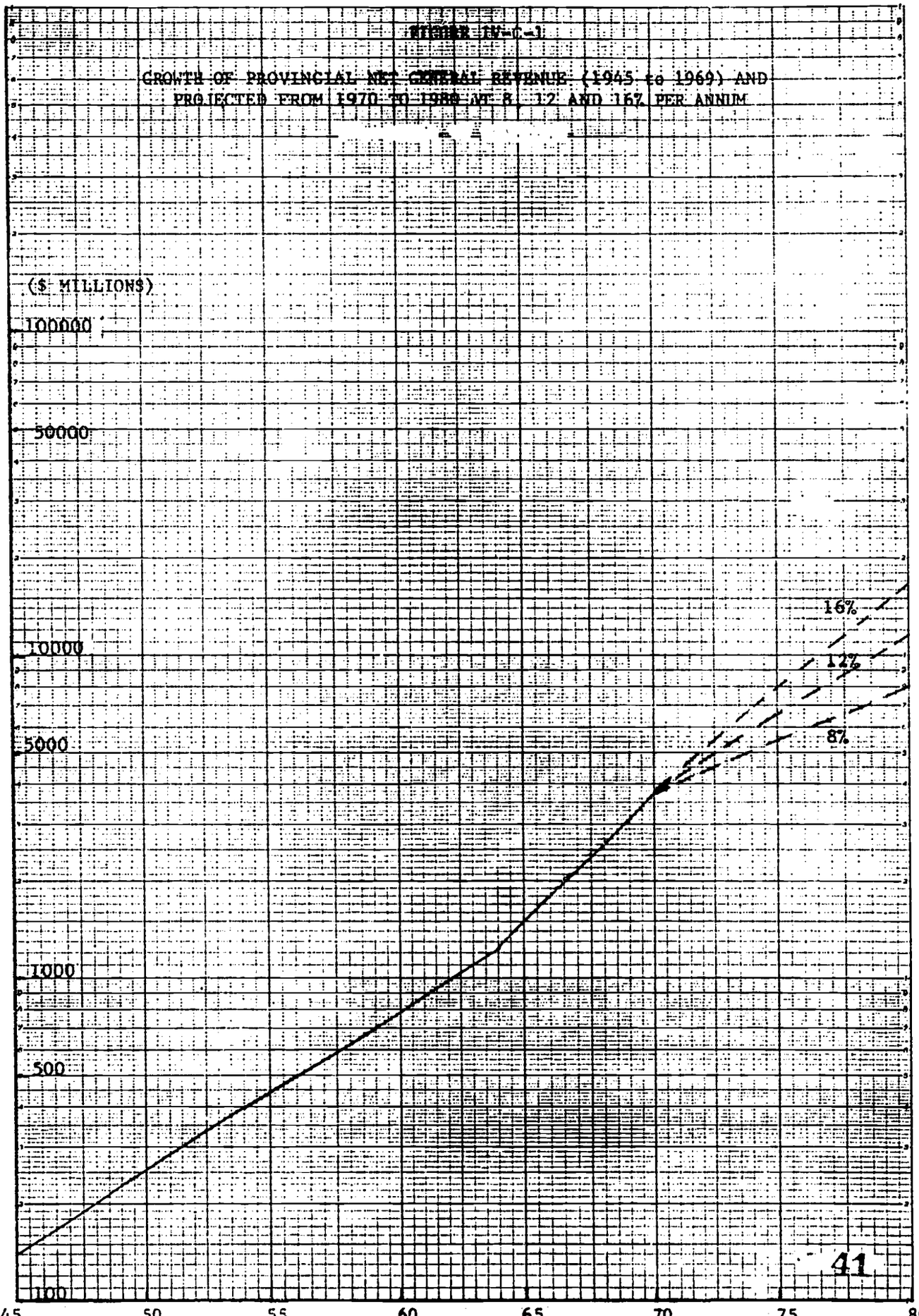
[4]The figures presented here represent a slight overestimate of total operating grants (or 3%) because they were computed on the basis of enrolment figures in which Waterloo Lutheran University, Regis College, the Ontario College of Art and the Royal Military College were included.

Is it realistic to expect these amounts of monies to be devoted to universities? One hinge upon which the answer must surely swing is the total amount of resources available to the government in 1975-76. During the last decade, total provincial revenues have increased at an average compound annual rate of nearly 16%, due in large part to a shift in spending from the private to the public sector. While it is likely unrealistic to expect such a growth rate to continue for another decade, we should point out that the Economic Council of Canada expects a continuing shift in spending from the private to the public sector. Thus, although it is difficult to say exactly what the magnitude of the shift will be, tax revenues will almost certainly continue to rise faster than growth in the economy. In part, this will result from the "fiscal-dividend" aspect of the progressive tax system. In addition, it must be pointed out that there is the likelihood (during the next decade) of a substantial shift of resources from the primary and secondary sectors of the educational system to the post-secondary sector. This will be made possible by stable or decreasing enrolments in primary and secondary education. It is only reasonable to expect resources to follow the population wave.

Growth of the Canadian economy (GNP) in recent years has been in the vicinity of 7% per annum. In contrast, provincial government revenue has grown at twice this rate. It seems reasonable to project the 16% rate of increase as an upper bound for the next decade, and half this rate as a lower bound.

Figure IV-C-1 shows provincial government revenues from 1945 to 1970, with projections to 1980 according to our three alternative postulated rates of growth. Our upper bound figure of 16% per annum would approximate the trend of the last decade. The 12% rate would approximate the trend of the previous 15 years. The 8% rate would represent a radical departure from the trend of



the past quarter of a century. Thus, we shall assume three rates of growth of provincial revenues of 8, 12 and 16 percent per annum.

With these growth rates, total provincial revenues would be $5.49, $6.59 or $7.85 billions by 1975-76. Thus, the percentage of provincial revenues going to university operating grants would rise under the base-line 8% growth rate assumption from 9.3% in 1970-71 to 11.2% in 1975-76. Even in the unlikely event of such a low growth rate in provincial revenues, we believe this increase in resources for the universities could be achieved by a transfer of resources following population shifts into higher levels of education, and still provide additional resources for qualitative improvements at primary and secondary levels. Under the more likely 12% assumption, the percentage of total provincial revenue allocated to university education would remain at 9.3% in 1975-76. With the high estimate of growth in provincial revenues, university grants would fall to 7.8% in 1975-76.

Bearing in mind the possibility of a transfer of resources within the educational sector, it appears to us that many recent gloomy statements about society's inability to meet the demand for resources by the educational sector are not borne out. Many alternative sets of possibilities could, and should, be explored. The set of assumptions given above did not, for instance, make any provision for qualitative improvement of the teaching process. Our major aim in presenting one set of assumptions is not to prejudge the future, but to suggest that the public's ability to pay is unlikely to be a constraint upon the continuation of present policies and practices into the foreseeable future.

We acknowledge that there is much questioning at the present time of current assumptions governing policies on university education in Ontario. Such questioning is legitimate and desirable. We are concerned, however, that too often financial spectres lie behind the questions; these spectres may not have substance. For instance, much of the appeal which some persons find in opportunity bank alternatives to university financing seems to derive

from the attraction of relieving the burden on the public purse. Similarly, contemplation of restrictions on foreign enrolments or the size of graduate programmes appears to have underlying financial motivations. All of these issues ought to be addressed, debated, and resolved in their own right on grounds of sound educational and public policy. We are disturbed, however, that certain alternatives appear to be under consideration as remedies for a financial ailment which is more imagined than real.

We have shown some possible patterns of increase in provincial revenue for the next decade with their possible impacts on university resources and have indicated that a transfer within the educational sector from primary and secondary to post-secondary is likely. We cannot be precise about our needs for resources but there have been inescapable forces with which we have had to contend in the last decade; a reading of social concerns at this time leads us to believe that these forces still will be with us in the next decade. Briefly these needs are to (1) maintain income levels of professional staff equal to that of peer groups in other public sectors and in the private sector, (if we do not quality will suffer), (2) introduce sophistication into the education process at a rate equal to or greater than that of the last decade, (3) cope with increasing numbers of students at a time when the multiversity alternative (i.e., simply increase the size of present universities) is being questioned.

With these projected needs it is difficult to see how the value of the income unit can increase less than the increase in price of services and goods in the public sector. This would imply a lower bound of about 5.5% at current rates just to meet the need for increases in universities' salaries and wages. We would be simply keeping up! The need for sophistication and the possible need to form one or more new universities or new programmes to meet the press of numbers would require the addition of some amount to the 5.5%.

It is difficult to form an upper limit but a sophistication index of 2% is certainly not unreasonable and new developments could add a couple more. The implied upper bound would thus be in the region of 9%. We want to point out that the 4.8% previously announced for 1971-72 falls below the lower limit and we would hope that the final determination of the 1971-72 unit value and the value for 1972-73 would take this expression of our anticipated needs into account.

V AREAS OF SPECIAL CONCERN

V-A The Burden of Assisted Research

It was noted in an earlier section that assisted research in Ontario universities had grown from just over $6 million in 1959-60 to over $46 million in 1969-70, a compound annual growth rate of 22%. If this trend were to continue, assisted research would reach $420 million by 1980, or as much as the entire operating expenditures of Ontario universities in 1970. This is unlikely, since the rate of growth of research funds has slackened off markedly in the past several years. We have developed a more likely estimate for the volume of assisted research in 1980, drawing upon certain of the projections and stated goals of the Science Council of Canada.

The Science Council Report No.4, Towards a National Science Policy for Canada, made the following statement in respect to expenditures on research and development:

> The Science Council does firmly believe that annual expenditures should and will rise rapidly in future and that the popularly discussed target level of around 2% of GNP will prove to be overcautious and will be surpassed.

In Special Study No. 6, Background Studies in Science Policy: Projection of R & D Manpower and Expenditure, prepared by the Science Secretariat, several alternative projections of gross expenditures on R and D in Canada were undertaken. One of the projections (not the highest) shows Canada reaching the 2% target by 1978. This projection assumes a rate of growth of 10.5% per annum from 1966. Examination of the rate of growth of assisted research in Ontario universities in the three years since 1966 reveals a rate of growth almost identical to this 10.5% per annum figure. We therefore have projected assisted research funds for Ontario universities

to 1980 at this rate, producing a figure of $140 million for assisted research. This would be a threefold increase from 1969-70, or about half the rate of increase of the previous decade.

We referred in an earlier section to the "fiscal drag" created by the indirect costs associated with assisted research. The best estimate of the overall size of the indirect costs is that provided in the Macdonald Report, namely 35% of direct costs (salaries of faculty excluded). Application of this figure to our projection of $140 million for direct costs in 1980 indicates that indirect costs will be about $50 million. These costs are real. They include plant maintenance, administration, library expenditures, computing centre costs, etc. If research is performed these costs must be met and they are now covered through general revenues. They are met at the expense of other programmes in the university, in particular, undergraduate teaching. If the present practices of major grantors failing to meet indirect costs continue to prevail the hardship on certain universities will be enormous, and indeed unbearable. It is well known that major universities carry the burden of research. The indirect costs fall disproportionately on these institutions. These same universities are the principal centers for graduate education and could not perform their educational function in the absence of substantial research activity. This is only one of several obvious reasons why universities must anticipate and plan for an expansion of their research during the seventies. However, if the indirect costs continue to be borne out of formula income it is inevitable that the established institutions will be forced to restrain the further development of research. A host of alarming consequences would follow.

Graduate education would be curtailed. The universities instead of rising to meet the research requirements essential to the solution of major social concerns of the seventies would simply permit their activities to plateau and continue to devote themselves largely to small scale unorganized research of a basic nature. While this activity is important it is not enough for the needs of society and if universities do no more they will become more subject to charges of irrelevance. Failure to advance the cause of university research in the new post-industrial age would be tantamount to denying the rising momentum for social change and the currents driving Canada and other countries to a service-oriented society.

For these reasons, and because of the inevitability of a self-imposed and damaging suppression on growth of research in the near future unless changes are made, CPUO urges the need for the government of Ontario and the universities to make the strongest possible representations to the government of Canada to adopt a policy of paying the indirect costs of research which it supports. CPUO recognizes of course that such a change in one year might create serious difficulties for the federal government and its agencies. There is no reason however that implementation of a policy of paying full indirect costs could not be introduced gradually over a period of three years.

CPUO subscribes fully to the observations and conclusions on this matter summarized as follows in the Macdonald Report:

> The upshot is as simple as the following: the failure of federal agencies to finance indirect costs exactly where they are incurred - in each university with a given volume of federally assisted research - has meant that federal research grants distort the university budgetary process. Accordingly, the availability

> of federal research funds restricted to direct-cost coverage impoverishes universities through a budgetary substitution effect similar to that which can be induced by conditional grants.
>
> We firmly believe that, in the interest of strong universities whose over-all academic performance is vital to the nation's research capacity, federally supported research should have a neutral budgetary effect in universities. Among other things, a neutral budgetary effect should be welcomed by the provinces, who bear the general responsibility for universities. The only way to guarantee this effect is through full federal payment, directly to each university, of all indirect costs associated with federally supported research.

V-B Part-time Education - Community Relationships

How does the university relate to the community in which it resides? How does it serve the concentric environments of the city or town, the local business community, the local cultural environment, the geographic area, the province, the nation and the world? Our concern here is with the immediate environment. The traditional stereotype of the university is that it is largely "residential" and that much of its cohesive strength and "esprit-de-corps" derives from this characteristic of residence; the claim is made that students living-in are much more at one with the university than the commuters. We hold that the residential characteristic will always be required to maintain the university in the liberal tradition serving the broad spectrum of society but we cannot ignore the mounting evidence that the university must become more attuned to the community that surrounds it. The evidence shows in many ways - in the criticism by taxpayer for his increasing tax burden much of it supporting "generally-educated" students who appear not to have professional, commercial or technical skills that are immediately marketable in the economy; in the

pressure by the business, professional and cultural communities to have universities offer recycling, up-grading and otherwise enlarging courses of all types on a part-time basis; and in the increasing demand for "part-time" and continuing education by adults of all ages. (Use of the 18-21 and 18-24 age cohort criteria will probably become outmoded by the end of the decade.) Availability of day care facilities, growth in numbers of part-time workers, larger participation in the labour force by women, equal treatment of part-time degree credit students by universities, and the desire to make facilities available for more hours of the week and more weeks of the year will contribute to a considerably more rapid growth in part-time enrolment than in full-time. Part-time undergraduate enrolment (in full-time equivalents) has grown at a compound rate of 25% from 8,900 in 1967-68 to 13,900 in 1969-70 in contrast to a full-time rate of about 18%. We believe the Economic Council estimates of part-time enrolment are conservative and that there may well be about 50,000 full-time equivalents made up of about 250,000 part-time students in 1980. (At this rate the head count of part-time students would approach that of full-time students in 1980-81.)

Some universities have consistently pursued the goal of equal treatment for part-time students. There is increasing pressure by part-time student organizations on other universities for parity of treatment also.

If growth proceeds at the rate expected and if the parity goal is thought to be proper, then a major adjustment to the operating grants formula is required and the Joint Subcommittee on Finance should begin the necessary analysis immediately.